Water Quality

IDEM has regulations regarding the discharge of industrial wastewater to surface waters (streams, ponds, rivers, etc.), groundwater (i.e. septic systems), and municipal sewers. Your shop may generate industrial wastewater from several sources including: film and plate processing; spent fountain solution; equipment washing; and inks, coatings, adhesives and cleaning solutions. The discharge of the industrial wastewater represents a significant environmental issue. Printers who incorporate pollution prevention techniques into their prepress and pressroom operations can reduce the need for wastewater treatment and minimize environmental impact on water quality.

City and Town Sewers

Local sewer authorities and IDEM regulate wastewater discharges.

You may discharge industrial wastewater to a city or town sewer system after receiving approval from the local sewer authority or IDEM. IDEM regulates the discharges of sewer treatment plants to local surface waters (e.g. rivers, etc.). In turn, the sewer authorities or treatment plants require, through local sewer ordinances, wastewater dischargers to comply with certain discharge limits and sewer use permits. These ordinances are also called, “pretreatment requirements for indirect dischargers”. (Indirect means the wastewater goes through a sewer system to a treatment plant and does not go directly to a river.)

Currently, 45 Indiana cities and towns have IDEM-delegated wastewater pretreatment programs in place. See list on page 118. They are the primary authority and issue wastewater discharge permits for their service area. However, there are local sewer districts who do not have pretreatment delegation. IDEM’s Office of Water Quality (OWQ) issues Industrial Wastewater Pretreatment Permits (IWPPs) to sewer dischargers in these areas.

What are Typical Discharge Limits?

There are general discharge restrictions that apply to all printers.

Regardless of municipality or regional treatment plant, there are general restrictions on the types of wastewater that can be discharged to the sanitary sewer. These restrictions help prevent treatment

plant upsets and ensure proper sewage treatment. The restrictions that generally affect printers include:

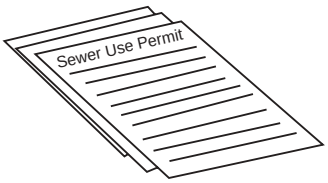
- **DO NOT** discharge flammable or combustible solutions (flash point less than 140°F) down the drain.
- **DO NOT** discharge malodorous (e.g., rotten egg smell, etc.) wastewater.
- **DO NOT** discharge any wastewater containing solids or viscous liquids (e.g., paper cuttings, adhesives, etc.) that may obstruct the flow in sewers.
- **DO NOT** discharge wastewater with a pH less than 5.0 or higher than 10.5. (This pH range will vary according to sewer treatment plant requirements.)
- **DO NOT** discharge excessive quantities of petroleum or mineral oils (e.g., lubricating oils, inks, etc.)
- **DO NOT** discharge excessive metals, such as silver, copper and zinc.

There may also be other discharge limits for organic and metal pollutants. The limits most likely to be of concern to a printer are: BOD_5, COD, oil & grease, silver, copper, and zinc. You should contact your local sewer authority or treatment plant to find out what local limits apply to your wastewater discharge. If you already have a local sewer permit or IWPP, then the permit discharge limits apply.

How Do I Get a Wastewater Discharge Permit?

The first step is to determine if your local sewer authority is approved to issue discharge permits.

If you have industrial wastewater discharges, check the list of towns and cities (page 118) with approved wastewater pretreatment programs. If your town is listed, then contact them directly to obtain a permit. They will provide you with an application. You may be required to test your wastewater discharge and submit the results with the application. Once the application is submitted, the approval process usually takes about 60-90 days.



Small printers who may have low volume discharges may be issued a permit exemption. However, the sewer authority can, at its discretion, require small shops to install silver recovery systems or comply with other local sewer ordinances in order to remain exempt.

If your town is not on the list, you must obtain an Industrial Wastewater Pretreatment Permit (IWPP) from IDEM. Call IDEM's Office of Water Quality to obtain a permit application. See contact information on page 113. The permit process includes a technical review of the application, issuance of a draft permit, and public comment. IDEM generally issues final IWPPs within 60 days of submittal.

What Type of Silver Recovery Should I Use?

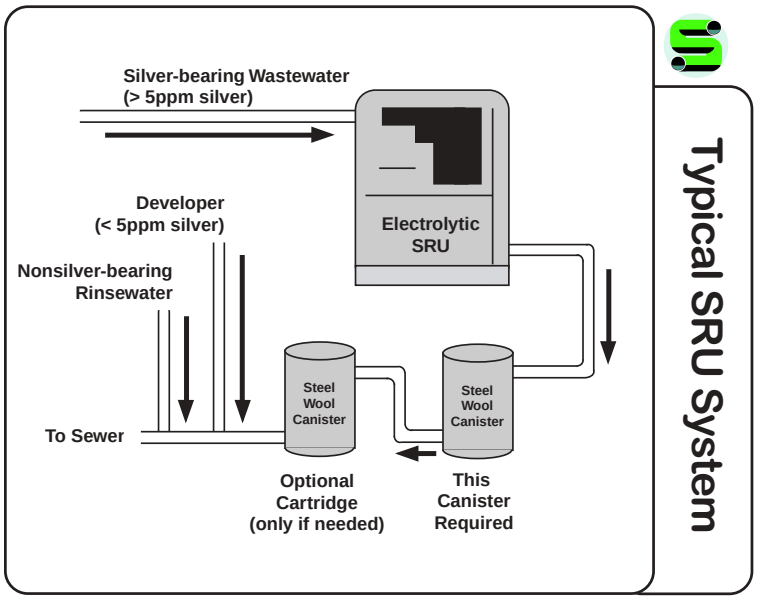
Photoprocessing wastewater can be discharged to the sewer, if you obtain approval from your local sewer authority.

You must remove as much silver from the wastewater in order to meet the discharge limit set by your local sewer ordinance, or your sewer use permit if you have one. Silver-bearing wastes include fixer, bleach-fix, stabilizers and PMT developers.

If you have a Silver Recovery Unit (SRU), it must be of adequate design and capacity for your volume of silver-bearing wastewater treated. To ensure adequate capacity, design the SRU system for peak flow periods and, if necessary, install a holding tank to meter the flow. SRUs should be maintained according to the manufacturer's specifications. We recommend that you keep a log for each SRU to ensure that SRU servicing and canister replacement is performed to ensure removal of the silver. (Your discharge permit may require additional recordkeeping.)

You can perform periodic sampling of the SRU discharge to ensure that the system is working properly. If you have a sewer use permit, the frequency, type and location of sampling are specified. There are two methods of silver testing. Silver estimating papers change color according to the amount of silver present. They are a low cost, quick check (but they cannot be used to determine permit compliance). If silver is present, then SRU servicing is required. We recommend that you have an analytical test done at least once a year, unless your permit requires more frequent testing. These tests generally cost $15-$20 each and are more accurate for determining compliance with your permit or local sewer ordinance. Make sure you check your permit, it may require more frequent testing and recordkeeping for silver and other parameters.

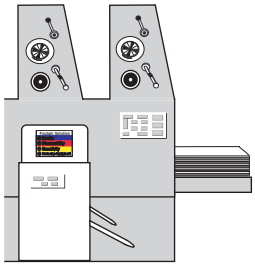
The most common SRUs are electrolytic, steel wool canisters and ion exchange units. If you have a low flow of silver-bearing wastewater, the electrolytic unit may not be needed. For example, a tabletop film processor may only need two silver canisters in series. The final SRU system design should be tailored to your silver discharge limit and processor flows. The lower the allowable limit, the more expensive and sophisticated the SRU system. When you purchase or lease a SRU, the supplier should guarantee it will meet your discharge limit.



What Do I Do With my Fountain Solution?

Fountain solution can be discharged to a sewer under certain circumstances.

Fountain solution is a waterbased solution with additives that promote ink and water separation on the plates. These additives generally include organics like glycol ethers or alcohol, and inorganic compounds that act as buffering agents. The organic compounds are regulated as VOCs and are counted toward your shop's emissions because fountain solution evaporates off the substrate. However, printers will flush the press fountains or recirculating systems from time-to-time and replenish them with new solution.



Spent fountain solution generally has contaminants in trace concentrations. They include paper dust, ink particulates and trace metals. The trace metals come from contaminating ink pigments and the wear and tear of the press dampening rollers. They may include barium, copper, chromium and zinc. Most spent fountain solutions can be discharged to the sewer without violating local discharge limits. However, printers should obtain local sewer authority (or IDEM) approval for sewer discharge of fountain solution.

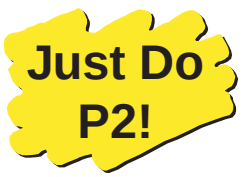
What is a Wastewater Survey?

A Wastewater Survey is a form used to describe your wastewater discharge.

Your local sewer authority or treatment plant may require you to complete a Wastewater Survey each year. Review the form carefully and reevaluate the volume and characteristics of the wastewater you discharge to ensure proper reporting. Some sewer authorities may also require annual wastewater analyses, if you are not already testing the wastewater as required by a permit. Generally, small printers do not have to perform wastewater analyses. The local sewer authority will usually accept an estimate of pollutant type and concentration in the wastewater discharge.

How Can I Prevent Pollution and Reduce my Shop's Wastewater Discharge?

There are viable Pollution Prevention techniques that reduce wastewater.



The following lists begins with low cost, common sense, best management practices that many printers have already implemented. P2 techniques are identified according to increasing capital, manhours and employee training.

While some techniques are more challenging to implement, they can

lower production costs, wastewater compliance costs, and increase your shop's competitiveness. They may be cost-effective strategies for you to consider, if you have not already. Contact PII or IDEM's CTAP, see 113 for more information.

This list is not all inclusive. It is provided to introduce many P2 techniques that have been successfully used by both small and large shops.

Just Do P2!

Wastewater P2 Tips

Prepress Operations	Small Shops	Midsize & Large Shops
For tray processing, use countercurrent washes. Reuse used rinsewater for the initial film wash and fresh water in the last rinse bath. When the last rinse bath needs changing, use it for the initial bath.	√	
Use floating lids on photochemical hand trays to maximize solution life.	√	
Order photochemicals according to minimum inventory needed and date to ensure first-in-first-out usage.	√	√
Substitute intensifiers, reducers and developers that do not contain mercury, cyanide salts and formaldehyde.	√	√
Change processor baths when no longer effective rather than on a fixed scheduled.	√	√
Extend bath life by adding replenishers. Test with a gray scale.	√	√
Substitute chromium-based system cleaners with products that are chromium-free or use a bleaching solution.	√	√
Calibrate processors to manufacturer specifications to minimize overflow.	√	√
Adjust or replace processor squeegees to minimize fixer and developer carryover, but still maintain film quality.	√	√
Ensure that the processor only discharges overflow in the processing mode. Some processors are designed to overflow in standby mode.	√	√
Install recirculators for developer, fixer and/or rinsewater. Rinsewater accounts for most of the wastewater discharged by processors.	√	√

Just Do P2!

Case Study

A small print shop installed a rinsewater recirculator on its only film processor. The recirculation unit cost $1,200 installed. By tuning up the processor to minimize developer and fixer carryover and recirculating the rinsewater, the printer saved almost $500 in water and photochemicals costs annually.

Just Do P2!

More Wastewater P2 Tips

Prepress Operations (cont.)	Small Shops	Midsize & Large Shops
Use rinse bath agitators.	√	√
Use countercurrent rinsing processors.	√	√
Evaluate silver-free films such as diazo, vesicular, photopolymer or selenium-based.		√
Use dry positive proofs or aqueous developed proofs.	√	√
Use digital proofers for low and mid-quality jobs.	√	√
Use subtractive plates instead of additive plates.	√	√
Change processing solutions based on plate counts.	√	√
Use laser printed, waterbased direct-to-plate or digital prepress systems to eliminate the use of film/plate processing.		√
Press Operations		
Perform routine maintenance on the clean dampening system.	√	√
Use alcohol substitutes in the fountain solution.	√	√
When alcohol is used, use chillers to minimize alcohol evaporation and extend solution life.	√	√
Use filter bags to remove paper dust and ink particulates in the fountain solution recirculation tank.	√	√
Cover fountain solution tank to minimize contamination with paper dust and dirt and minimize evaporation.	√	√
Minimize volume of fountain solution "dumps" by running the solution as low as possible in the recirculation tank before discharge.	√	
Monitor water conductivity and pH of fountain solution.	√	√
Install pretreatment system (e.g., reverse osmosis) to condition water for fountain solution.		√

Just Do P2!

Case Studies

A print shop used alcohol-based fountain solution in its older two-color presses and envelope printing presses. It cost the printer approximately $1,000 a year for alcohol. Over a three month period, alternate solutions were tested first on lower quality jobs before using promising candidates on the more critical jobs. The printer was able to completely eliminate the alcohol with minimal disruption in production or print quality.

A printer was subject to a low silver discharge limit. In order to comply, the printer first rebuilt and fine tuned its two film processors. Then fixer and rinsewater recirculators were installed with silver recovery. Additional silver tailing units were added to treat any tank "dumps" and residual overflow. Cost to the printer – $4,000 installed. But the printer saved approximately $2,000 annually on film, wastewater disposal costs and reduced photochemical use. The conversion also extended the operating life of the processors.

Wastewater Discharges to Surface Waters

IDEM and EPA regulate discharges of wastewater to any surface water, such as wetlands, rivers, streams or lakes.

If you discharge to surface waters, you are required to obtain a discharge permit (also called a National Pollutant Discharge Elimination System or NPDES permit), regardless of the volume or characteristics of the wastewater. In addition, the wastewater may have to be treated before discharge, and you will be subject to extensive wastewater monitoring and reporting requirements.

If you have no other option for wastewater disposal, you must submit an application to IDEM to obtain a permit before discharging to surface waters. The application and approval process is lengthy and resource intensive. You may want to seek a consultant with expertise in NPDES permits. Only the largest printers consider surface water discharges.

You should seriously consider all options before discharging to surface waters. For more information, call the Office of Water Quality at IDEM. See page 113 for contact information.

Septic Systems

You are not allowed to discharge any industrial wastewater to a septic system.

You can discharge sanitary wastewater to an onsite septic system. Septic systems do not provide adequate treatment of industrial wastewater.

If you have a septic system, you are required to ship your film and plate wastewater, waste fountain solution and any other process waste streams offsite for treatment. If the industrial wastewater is not regulated as hazardous (page 22), you may be able to use a septage hauler that collects septage/wastewater for disposal at a wastewater treatment plant. If you cannot find a septage hauler, you can ship it offsite as nonhazardous industrial wastewater to a state-approved treatment/disposal facility.

Stormwater Discharges

Contaminated stormwater runoff has a significant environmental impact.

IDEM has regulations for the management and permitting of stormwater discharges. For printers, two conditions must exist before a stormwater discharge

permit is required. First, stormwater and/or melting snow must come into contact with chemicals or materials that can contaminate it. Second, the stormwater or melted snow is discharged to surface waters such as wetlands, rivers, streams or lakes. (This also includes stormwater indirectly discharged to surface waters via a municipal sewer system.)

You do not need a stormwater discharge permit for the following discharges:

- Sprinkler system flushing
- Uncontaminated air conditioning condensate
- Lawn sprinklers
- Covered loading docks
- Covered or sealed trailers used for recycled paper collection

Here are sources found at print shops that generally require a stormwater discharge permit.

- **Outside storage of chemicals and empty containers**
- **Uncovered aboveground storage tanks (or without secondary containment)**
- **Uncovered ink fill pipe connections**
- **Outside fuel dispensing operations**
- **Onsite fleet vehicle maintenance shops**
- **Contaminated or oil soaked pallets stored outside**
- **Open compactors or dumpsters (no lids or overhang roofs) that are used for empty chemical container disposal**
- **Uncovered loading dock platforms**

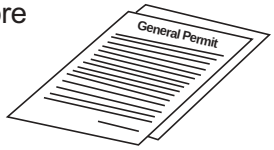
There are three options, if you have outside activities and discharge stormwater to surface waters.

Option 1	Relocate materials and/or activities inside.
Option 2	Build shelters around or roofs over materials and/or activities conducted outside.
Option 3	Continue your activities and obtain a stormwater discharge permit.

How Do I Get a Stormwater Permit?

There are two types of stormwater permits available to printers – general and individual permits.

The general permit is a simplified permit for general industry (including printers). It typically does not require stormwater testing and allows the printer to use Best Management Practices (BMPs) to minimize stormwater contamination. The individual permit is a more comprehensive permit for complex facilities. Only the large printers should consider an individual permit. However, all printers with outside activities and discharging stormwater are required to have at least a general permit.



To obtain a general permit, you must submit a Notice of Intent (NOI) to the Office of Water Quality at IDEM. If you need an individual permit, you must complete a more comprehensive application (Form 1) and conduct stormwater testing. The NOI and Form 1 are available from IDEM. See page 113 for contact information.

General Stormwater Pollution Prevention Plan

Printers with a general stormwater permit must prepare and implement a Storm Water Pollution Prevention Plan (SWP3).

The SWP3 is intended to help printers identify activities and industrial areas which contribute to stormwater contamination and where BMPs (Best Management Practices) need to be established. In preparing this plan, you should design it to minimize future revisions. Put equipment lists, phone numbers, and site plans, etc. on separate pages for easy updating. You must review the plan by January 28th annually to make sure it is current. Plan revisions are also required when equipment/procedures change or if you implement the plan and any of the procedures are inadequate. The plan must be fully implemented within one year of obtaining your general permit.

For printers, the use of BMPs provides several benefits in place of traditional engineering controls to prevent contamination of stormwater discharges. Here are some of the common BMPs for printers.

Stormwater – Best Management Practices for Printers

Plates & Film	Store inside on pallets or drums before pickups.
Pallets	Do not accumulate. Reuse or discard immediately. If possible, store inside.

Stormwater – Best Management Practices for Printers (cont.)

Storage Tanks	Locate ink, fuel oil and solvent tanks inside. Ensure that fill pipes are covered with drip trays. If located outside, use double-wall tanks or cover with roofs.
Empty Drums & Containers	Do not store on loading dock platforms. Store inside.
Dumpsters & Compactors	Use lids or cover with shelters.
Loading and Unloading Chemicals	Do not unload or load during rainstorms. Do not store containers on loading docks.
Outside Spills	Clean up spills immediately.
Vehicle Fueling Operations	Cover dispensers and install grooved pavement.
Fleet Vehicle Washing	User only pressurized water or use an offsite washing service.
Fleet Maintenance	Perform fleet maintenance activities inside. Do not store parts outside. Install storm drains inside garage connecting to an oil-water separator. Protect floor drains from spills.

What if I am Exempt from a Stormwater Permit?

You must complete and submit a "No Exposure Storm Water Certification".

The No Exposure Storm Water Certification form is a two-page fill-in-the-blank form. The form is available from IDEM's Office of Water Quality or the IDEM website at:

http://www.in.gov/idem/owm/appforms.html

You will need to provide your shop's latitude and longitude and other basic company information on Page 1. On Page 2, you will certify to having no outside operations potentially contaminating storm-water. The form is sent to the IDEM's Office of Water Quality, Permits & Compliance Branch. See page 113 for resources. Keep a copy of the form on file. Submittal of this form will be required every five years.